Complete Listing of Claims

1. (Original) A motor comprising:

a plurality of excitation coils;

a commutator having a plurality of segments, wherein each coil is connected to corresponding ones of the segments;

a plurality of supply brushes slidable on the segments, wherein the supply brushes include a plurality of supply brushes each having one of an anode and a cathode, and at least one supply brush having the other one of an anode and a cathode, and wherein the supply brushes each simultaneously contact different one of the segments; and

a short-circuit line for short-circuiting segments that simultaneously contact the supply brushes of the same pole,

wherein the supply brushes of the same pole separate from the short-circuited segments at different times.

2. (Original) The motor according to claim 1, wherein, among the supply brushes of the same pole, the supply brush that lastly separates from the short-circuited segment has a higher electrical resistance than the other supply brushes of the same pole.

3. (Original) The motor according to claim 1, wherein, among the supply brushes of the same pole, the supply brush that lastly separates from the short-circuited segment has a greater volume than the other supply brushes of the same pole.

4. (Original) The motor according to claim 1, wherein the segments are arranged along a circumferential direction of the commutator and have the same circumferential width;

wherein the supply brushes of the same pole have the same width as the segments along the circumferential direction of the commutator; and

wherein, when one of the supply brushes of the same pole is contacting one of the segments without displacement, the other supply brushes of the same pole contact the corresponding ones of the segments with displacement along the circumferential direction.

5. (Original) The motor according to claim 1, wherein the segments are arranged along a circumferential direction of the commutator and have the same circumferential width;

wherein each of the supply brushes of the same pole has a predetermined effective contacting width along the circumferential direction of the commutator, in which effective contacting width the supply brush contacts segments, wherein the effective contacting widths are the same as the circumferential width of the segments;

wherein, if the short-circuited segments are imaginarily overlaid on each other without circumferential displacement while maintaining the relative positions with the contacting brushes, the effective contacting width of the overlaid brushes along the circumferential direction of the commutator is greater than the circumferential width of the segments.

6. (Original) The motor according to claim 1, wherein the segments are arranged along a circumferential direction of the commutator and have the same circumferential width;

wherein each of the supply brushes of the same pole has a predetermined effective contacting width along the circumferential direction of the commutator, in which effective contacting width the supply brush contacts segments, wherein the effective contacting width of at least one of the supply brushes of the same pole is less than the circumferential width of the segments;

wherein, if the short-circuited segments are imaginarily overlaid on each other without circumferential displacement while maintaining the relative positions with the contacting brushes, the effective contacting width of the overlaid brushes along the circumferential direction of the commutator is equal to or greater than the circumferential width of the segments.

7. (Original) The motor according to claim 1, wherein the segments are arranged along a circumferential direction of the commutator and have the same circumferential width;

wherein each of the supply brushes of the same pole has a predetermined effective contacting width along the circumferential direction of the commutator, in which effective contacting width the supply brush contacts segments, wherein the effective contacting widths are less than the circumferential width of the segments; and

wherein, if the short-circuited segments are imaginarily overlaid on each other without circumferential displacement while maintaining the relative positions with the contacting brushes, the effective contacting width of the overlaid brushes along the circumferential direction of the commutator is less than the circumferential width of the segments.

8. (Original) The motor according to claim 1, wherein the segments are arranged along a circumferential direction of the commutator and have the same circumferential width;

wherein each of the supply brushes of the same pole has a predetermined effective contacting width along the circumferential direction of the commutator, in which effective contacting width the supply brush contacts segments, wherein, among the supply brushes of the same pole, the effective contacting width of the supply brush that lastly separates from the short-circuited segment is greater than the other supply brushes of the same pole;

wherein, if the short-circuited segments are imaginarily overlaid on each other without circumferential displacement while maintaining the relative positions with the contacting brushes, all the supply brushes of the same pole are within the effective contacting width of the supply brush of the same pole that has the greatest effective contacting width with respect to the circumferential direction of the commutator.

9-24. (Cancelled)

25. (Original) A motor comprising;

six magnetic poles arranged at equal angular intervals along a circumferential direction, wherein each adjacent pair of the magnetic poles have different magnetic properties;

an armature having eight teeth, the teeth being arranged at equal angular intervals along a circumferential direction;

eight excitation coils, each being wound about one of the teeth by way of concentrated winding;

a commutator having twenty-four segments, wherein ends of each excitation coil are connected corresponding ones of the segments;

a plurality of short-circuiting members, wherein each short-circuiting member connects two of the segments that are connected to the excitation coils and one of the segments that are not connected to the excitation coils to one another, such that two of the excitation coils that are arranged at a 135° interval about the axis of the armature are simultaneously supplied with electricity, and wherein the segments in each group of short-circuited three segments are arranged at 120° intervals; and

a plurality of supply brushes slidable in the segments, wherein the supply brushes include first and second brushes at the same pole, wherein the second brush has a higher electrical resistance than the first supply brush, wherein the first and second supply brushes simultaneously contact the two segments in one of the sets of three segments that are connected to the corresponding excitation coils, wherein the first and second brushes are arranged at an angular interval less than 120°, so that, when the first brush separates from the contacting segment, the second brush separates from the segment that is short-circuited with the segment from which the first brush has separated after a delay.